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SENATE TAXATION

EXHIBIT NO. 5

DATE 2.13.09

BILL NO. SB258

BOARD •

February 12, 2009

Senator Ron Erickson
Senate Taxation Committee
2009 Montana Legislature

Dear Senator Erickson:

As per your request, The Policy Institute is providing you with 11 copies of the two academic studies cited by Bob Decker in his testimony in favor of SB 258 this morning.

Please note that the Headwaters Economics report, "Energy Revenue in the Intermountain West" is provided in full. Since the University of Wyoming report, "Mineral Tax Incentives, Mineral Production and the Wyoming Economy," is more than 300 pages in length, I have printed out the Executive Summary from the report for your review. The complete report can be found at <http://eadiv.state.wy.us/mtim/StateReport.pdf>.

Please let us know if we can be of further assistance. Thank you for your consideration of Senate Bill 258.

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A Report from the *ENERGY AND THE WEST* Series by



Energy Revenue in the Intermountain West

**State and Local Government Taxes and
Royalties from Oil, Natural Gas, and Coal**

No. 4 in a Series of 8 Reports

October 2008

ENERGY REVENUE IN THE INTERMOUNTAIN WEST

State and Local Government Taxes and Royalties from Oil, Natural Gas, and Coal

Headwaters Economics, Bozeman, Montana

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ABOUT HEADWATERS ECONOMICS

Headwaters Economics is an independent, nonprofit research group. Our mission is to improve community development and land management decisions in the West.



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ABOUT THE *ENERGY AND THE WEST* SERIES

This report is the fourth in a series—*Energy and the West*—published by Headwaters Economics on the topic of energy development. This series is designed to assist the public and public officials in making informed choices about energy development that will benefit the region over the long term.

The reports in the *Energy and the West* series, listed below, cover the policy context for energy development in the West and the resulting impacts to states, counties, and communities viewed from the perspective of economic performance (*i.e.*, jobs, personal income, wages) and fiscal health (*i.e.*, state and county budgets, revenues and expenses). The series also includes forthcoming state and local area case studies, which highlight benefits and costs in greater detail.

Titles in the *Energy and the West* series:

- Energy Development and the Changing Economy of the West
- U.S. Energy Needs and the Role of Western Public Lands
- Fossil-Fuel Extraction as a County Economic Development Strategy: The Performance of Energy-Focusing Counties in the West
- Energy Revenue in the Intermountain West: State and Local Taxes and Royalties from Oil, Natural Gas, and Coal
- Impacts of Energy Development in Colorado, with a Case Study of Mesa and Garfield Counties
- Impacts of Energy Development in Wyoming, with a Case Study of Sweetwater County
- Potential Impacts of Energy Development in New Mexico, with a Case Study of Otero County
- Potential Impacts of Energy Development in Montana, with a Case Study of Custer County

To access these reports, go to: www.headwaterseconomics.org/energy.

TABLE OF CONTENTS

Introduction.....	1
Summary Findings	2
Which States Capture the Highest Effective Tax Rates from Energy Development?	5
Summary Findings	17
Does State Tax Policy Affect the Scale of Energy Exploration and Production, and the Amount Revenue Captured by Government?.....	20
Summary Findings	21
How Well Does Each State Direct Revenue from Energy Development to Manage its Impacts, and Invest and Spend Revenue to Build Long-term Wealth?.....	23
Summary Findings	31
Conclusions	32
Endnotes	33

INTRODUCTION

A group of state senators and representatives recently toured Colorado's West Slope to assess how communities are experiencing the current surge in oil and natural gas development. They agreed that the tens of millions of dollars in tax and royalty revenue these communities currently collect from oil and natural gas wells are not enough to mitigate the same industry's impacts on wildlife, roads, and public services.¹ Just over the state's northern border, the Wyoming state legislature faces a different policy issue: what to do with a billion dollar surplus generated by that state's taxes on and royalties from energy industries.

What accounts for such divergent experiences from the current surge in energy development across the Intermountain West? Economists may never arrive at the definitive answer, but one place of agreement is that tax policy matters. State and local governments make critical decisions concerning how to tax oil, natural gas, and coal extraction, and how to distribute the resulting revenue. These are watershed choices that have immediate and long-term implications for their citizens' quality of life.

For example, community leaders across the Intermountain West are finding that revenue from energy development is crucial for mitigating the impacts of extraction activities on public health, local infrastructure, and the environment. And states can benefit when revenue is sufficient—after paying to mitigate impacts—to invest in permanent funds, schools, and economic development that improve a state's long-term fiscal and economic well-being.

However, the reverse is also true: failing to tax well, or to spend and invest tax proceeds wisely, can negatively affect the quality of life and competitive position of places where energy development is occurring in the Intermountain West.

In this report, we compare how well five Intermountain West states—Colorado, Montana, New Mexico, Utah and Wyoming—capture revenue from energy development, and how well they direct these resources to fund pressing public needs and to build long-term wealth for the states' citizens. We explain the main differences between each state's taxing and spending strategies, and highlight respective strengths and weaknesses.²

In the first section of this report, we examine differences in how effectively each state captures revenue from energy development. This involves a close look at each state's "effective tax rate," which is the ratio of tax revenue to the gross value of the energy produced—*i.e.*, higher effective tax rates capture more value from production than lower effective tax rates.

Section two analyzes the relationships between tax rates, the pace and scale of drilling activities, and tax revenue.

Section three profiles how the states differ in their choices about using energy revenue—specifically in how much priority they give to: one, addressing immediate needs directly related to energy extraction; two, paying for current general government operations and public education; and three, investing in permanent funds to provide income to meet future needs.

Questions Answered in this Report:

1. Which states capture higher effective tax rates and do the best job of managing the volatility of energy tax revenue?
2. Does state tax policy affect the scale of energy exploration and production, and the amount of revenue captured by government?
3. How well does each state direct revenue from energy development to manage its impacts, and invest and spend revenue to build long-term wealth?

SUMMARY FINDINGS

Effective tax rates vary dramatically between states, with some states capturing significantly higher amounts of tax revenue from oil, natural gas, and coal production.

Wyoming's effective tax rate of 15.9 percent is one and a half times higher than Colorado's 6.2 percent effective tax rate. New Mexico's 15.0 percent, Utah's 12.1 percent, and Montana's 9.8 percent effective tax rates also show significant variation between the states. Higher effective tax rates will capture more value from the same amount of production, providing government with more revenue. This means Wyoming is in the best fiscal position to mitigate the impacts of energy extraction, and will have more options for investing and spending energy revenue in ways that build long-term wealth. Colorado's low effective tax rate will make it less able to respond to pressing needs, and to leverage wealth from non-renewable resources into broader economic growth.

Public revenue derived from energy production is inherently volatile and states benefit if they address this instability proactively.

Energy taxes and royalties are based on production value, which can be highly volatile. As a result, energy revenue can be highly volatile, too. Providing services from an uncertain revenue stream makes long-term fiscal planning difficult, and can be risky particularly for rural counties and small towns. Local government may use energy revenue to hire new police officers, or to build a new school, only to see these revenue fall if energy prices or production drops off. Tax structure has an important dampening or exaggerating effect on revenue volatility, so states have the ability to bring greater predictability to their revenue stream. Colorado and Utah have done relatively poorly at adopting tax policy that manages volatility, while Wyoming and New Mexico have done relatively better.

States can increase effective tax rates and realize higher revenue from energy development with little risk of affecting the local energy economy.

The oil, natural gas, and coal industries are guided chiefly by the location of reserves, and are less able to relocate than are industries with mobile capital resources (such as textile mills or auto-makers). Other factors such as price, access to markets (*e.g.*, oil and natural gas pipelines), and technology have more significant effects on industry activities. We also find no evidence to suggest that the dramatically different effective tax rates in the Intermountain West we have led to more or less investment from state to state. Montana reduced its tax rates and extended incentives to the oil and natural gas industries in the late 1990s. At the same time, Wyoming studied the issue, finding that new incentives were unlikely to stimulate new exploration and drilling, and chose not to alter its tax structure. The results of these choices are clear: Wyoming has captured proportionately higher benefits than Montana from the current surge in energy production value, and there is no evidence that Montana's tax breaks worked—Montana has stimulated less, not more, energy development than Wyoming and left more than half a billion in revenue on the table.

Some states direct higher sums to address immediate needs directly related to energy extraction, while others do a better job investing in permanent funds to provide income to meet future needs.

Colorado and Utah distribute the highest proportions of revenue from energy production to communities and agencies managing the direct impacts of extraction activities. Wyoming and New Mexico retain proportionately more at the state level, depositing revenue in the state general fund. On the one hand, these two states steer smaller proportions of energy production tax revenue to communities where the impacts from energy development are often acute and can erode quality of life for citizens if they are not adequately mitigated. On the other hand, Wyoming and New Mexico have invested the largest amount of energy revenue into permanent funds, which now generate significant income that helps to pay for education and infrastructure statewide. Montana rests squarely in the middle, sharing oil and natural gas production taxes evenly between the state and local governments where energy production is taking place.

TAX POLICY PRIMER: BASIC TERMS AND HOW STATES TAX ENERGY RESOURCES

Energy Revenue

Refers to taxes and royalties paid to federal, state and local governments that are derived directly from the extraction of oil, natural gas, and coal. The majority of energy revenue come from production taxes (including severance), property taxes, and state and federal royalties, each linked directly to the production value of energy resources.³

Mineral

Federal and state authorities that regulate and tax fossil fuel energy resources—such as oil, natural gas, and coal—often refer to “mineral” revenue, which is a category that also includes other mineral commodities such as hard rock minerals, sand, and gravel. Because of limitations in the level of detail available from federal and state data sources, it is sometimes not possible to separate energy resources from these other mineral commodities. The bulk (over 80%) of “mineral” tax and royalty revenue is related to energy resources.

Production Value

Energy revenue is generated from taxes and royalties levied against the production value of oil, natural gas, and coal extraction. Production value is the sum of the price and the production volume, and can vary dramatically from year to year.

Production Taxes (includes Severance Tax)

A production tax is a tax on oil, natural gas, and coal extracted, or severed, from the earth. Production taxes on oil and natural gas are tied to production value, and rise and fall with energy prices and production, sometimes dramatically. Coal severance taxes are based on tonnage, and tend to be more stable from year to year. Oil and natural gas producers deduct transportation and processing costs and mineral royalties from gross production value to reach the net, or taxable value. Each state also has a complicated and varied matrix of tax rates, incentives, and exemptions that affect the amount of tax collected.

Property Taxes

Property taxes, like production taxes, tax the production value of energy resources extracted from the ground. Pipelines, land, and equipment are also taxed in most states. Property taxes are calculated by the formula:

Net Market Value \times Assessment Rate \times Mill Levy = Tax Bill

- Net Market Value is equal to gross production value minus transportation and processing costs and royalties.
- The Assessment Rate is the percent of the net market value subject to property taxation.
- A Mill Levy is the “tax rate” each county, city, and school district levies to fund local services. A complex mix of state and local laws restrict the number of mills that make up the mill levy, and may also limit how fast revenue and spending can grow.

Royalties

Royalties are “production” taxes paid to the land owner, including federal and state governments, Indian tribes, and private individuals. Federal royalties are paid to the U.S. Treasury, and roughly half are returned to the states. Roughly half of federal royalties are returned to the state where drilling takes place. State royalties range from 12.5 percent in Colorado to 16.7 percent in Wyoming. Royalty figures include bonuses paid through the competitive leasing process (a premium paid by a company to win a leasing contract to drill in a specific area) and fees or rents paid to maintain a lease.

WHICH STATES CAPTURE THE HIGHEST EFFECTIVE TAX RATES FROM ENERGY DEVELOPMENT?

The amount of revenue each state captures from the extraction of non-renewable energy resources is important to a state's fiscal capacity to protect the quality of life enjoyed by its citizens.

Energy development is intensive, and its impacts on communities and the environment can be both acute and lasting (*e.g.*, spills from drilling rigs into surface water and long-term contamination of underground aquifers). States have significant regulatory and taxing authority to monitor and mitigate these impacts, and maintain the existing quality of infrastructure and services. They typically also set aside energy revenue to ensure that the one-time extraction of a resource pays dividends into the future.

States that capture high effective tax rates are better prepared to deal with impacts, and have more options for investing in approaches to sustaining long-term wealth.

Taxes and royalties on oil, natural gas, and coal are based on the production value of energy development. The "effective tax rate" is the ratio of energy revenue to the gross value of the energy produced—*i.e.*, governments with higher effective tax rates capture more value from the same amount of production as do governments with lower effective tax rates.

In this section we present production value and revenue data from energy resources in Colorado, Montana, New Mexico, Utah and Wyoming. We compare these data to calculate the effective tax rate for each state. We also highlight some of the strengths and weaknesses of each state's tax structure and how it contributes to higher or lower revenue. Finally, we examine the role tax policy plays in dampening or exaggerating the volatility inherent in energy revenue.

Total Revenue from Energy Resources

Figure 1 shows the relative importance of energy revenue to each state. The U.S. Census of Governments publishes annual summary statistics of all state and local government revenue across the country. These data provide for easy comparisons between states. Using both state and local government budgets is important for two major reasons: one, energy revenue is collected by and distributed to both state and local agencies; and two, the way services are provided varies between states, (*e.g.*, public schools receive a larger proportion of funds from the state in New Mexico compared to Montana, where property taxes are the largest funding source for school districts). When these factors are considered, one can see clearly in each state the portion of total state and local government revenue that comes from energy development.

Figure 1: Energy Tax Revenue as a Portion of Total State and Local Government Revenue, 2006, Colorado, Montana, New Mexico, Utah and Wyoming.⁴

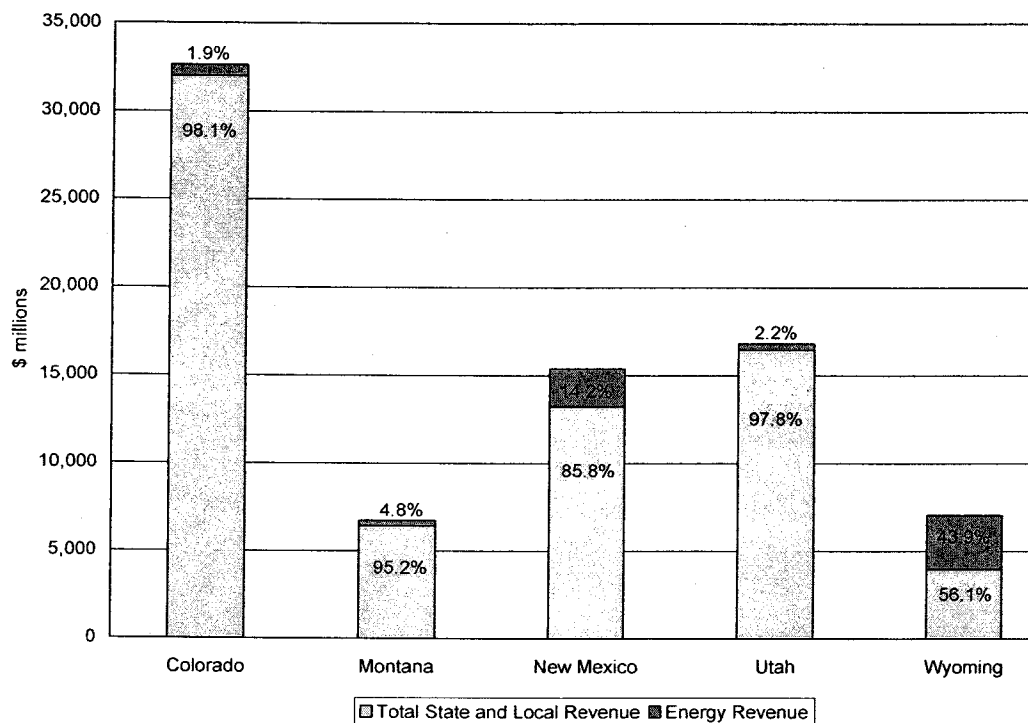


Figure 1 shows that Colorado's combined state and local government revenue is large when compared to its peers, and energy revenue makes up only a small proportion, just under 2 percent, of all government revenue in 2006. Wyoming's budget, by comparison, is small, and heavily dependent on energy production for revenue. Wyoming received 44 percent of all general government revenue from energy production in 2006. Energy revenue is also important in New Mexico, contributing 14 percent of all government revenue. Montana receives 5 percent of all revenue from energy production, and Utah receives more modest revenue from oil, natural gas, and coal at about 2 percent.

In each state, the lion's share of energy revenue comes from three main sources: production taxes, property taxes, and mineral royalties. The relative importance of these three revenue streams is shown in Figure 2.

Figure 2: Contribution of Production Taxes, Property Taxes, and Royalty Revenue to Total Energy Revenue, 2006, Colorado, Montana, New Mexico, Utah, and Wyoming.⁵

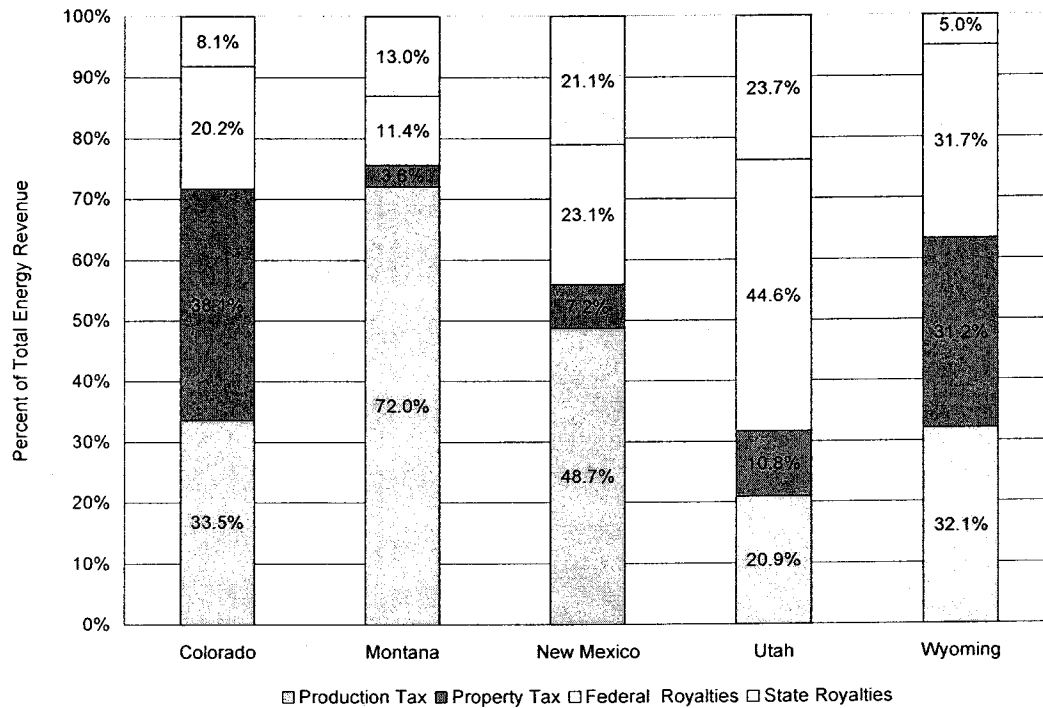


Figure 2 shows that in general, production taxes (green) are the single largest source of energy revenue. Federal and state royalties (yellow and blue, respectively) are relatively more important in states with more drilling on public lands, including Utah and New Mexico. The comparative importance of royalties in these states is exaggerated because royalties are deductible from many production taxes, reducing overall production tax revenue as royalty payments increase. Property taxes (red) are important in Colorado and Wyoming. Montana does not levy property taxes on oil and natural gas, but about half of production taxes are returned directly to local government in return for the state eliminating the property tax in the late 1990s.

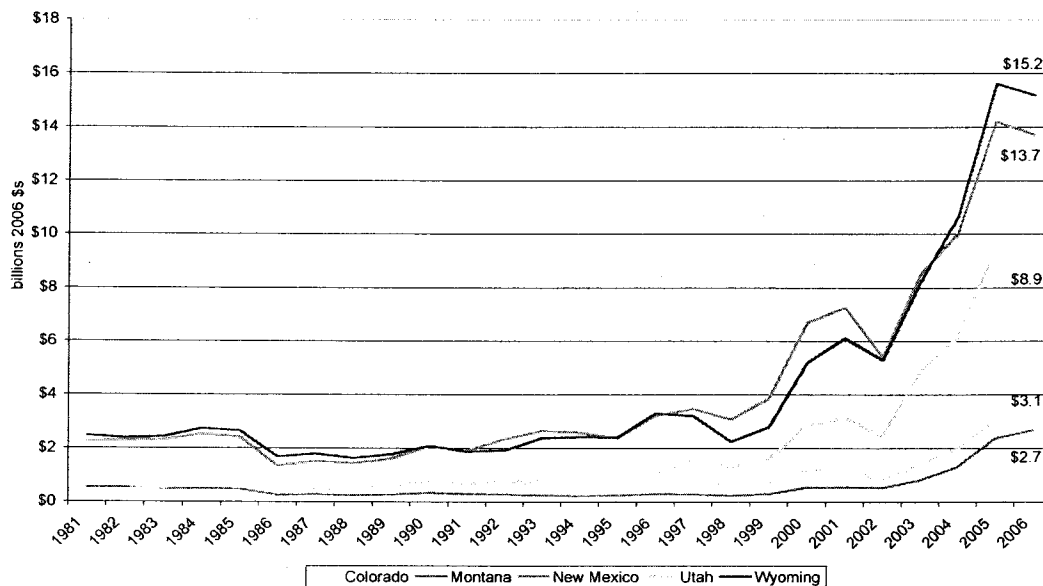
The particular makeup of each state's revenue stream can be important to how revenue is received, and what kinds of services are ultimately funded. For example, production taxes are levied against the current year's production value, while property tax collections can lag production by two years. Governments most reliant on property taxes may find it more difficult to keep pace with surging energy production because of this lag. We explore these issues in detail later in this report.

Energy Production Value

Production value is the basis for mineral taxation, and is a measure of the revenue potential from energy commodities. Production value is the sum of production volume (measured in barrels of oil, cubic feet of natural gas, or tons of coal) times price.

Most of the growth in production value from energy development since 2000 has been due to rapidly increasing commodity prices and a surge in drilling for natural gas spurred by high prices and new technologies. Figure 3 illustrates the production value of oil and natural gas over the last 25 years. Figure 4 illustrates the production value of coal over the last 25 years.

Figure 3: Production Value of Oil and Natural Gas in Colorado, Montana, New Mexico, Utah, and Wyoming, 1981–2006 (2006 Dollars).⁶



The Energy Information Administration publishes annual information on production volumes of oil, natural gas, and coal, and the average price in each state. Using these data from a common source yields consistent and comparable production value figures for each state in each year.

Figure 3 shows that Wyoming has the highest production value of oil and natural gas at over \$15 billion in 2006, followed by New Mexico with \$13.7 billion, Colorado at nearly \$9 billion, and Utah at \$3 billion. Montana has the lowest production value from oil and natural gas at \$2.7 billion.

Declines in production values in the 1980s, particularly in Wyoming and New Mexico, were driven by declining levels of oil production as prices remained relatively static. The dramatic increases in production value since 1999 are largely due to higher commodity prices and new natural gas production. For example, natural gas production volume increased 50 percent in the five states between 1996 and 2006, and natural gas prices more than tripled over the same period.

The steep declines in oil and natural gas production value in 2003, and again in 2006, shown in Figure 3 reflect a decrease in commodity prices. In both of these years, production volumes continued to rise, but significant volatility in price led to steep declines in production value.

Figure 4: Production Value of Coal in Colorado, Montana, New Mexico, Utah and Wyoming, 1985–2006 (2006 Dollars).⁷

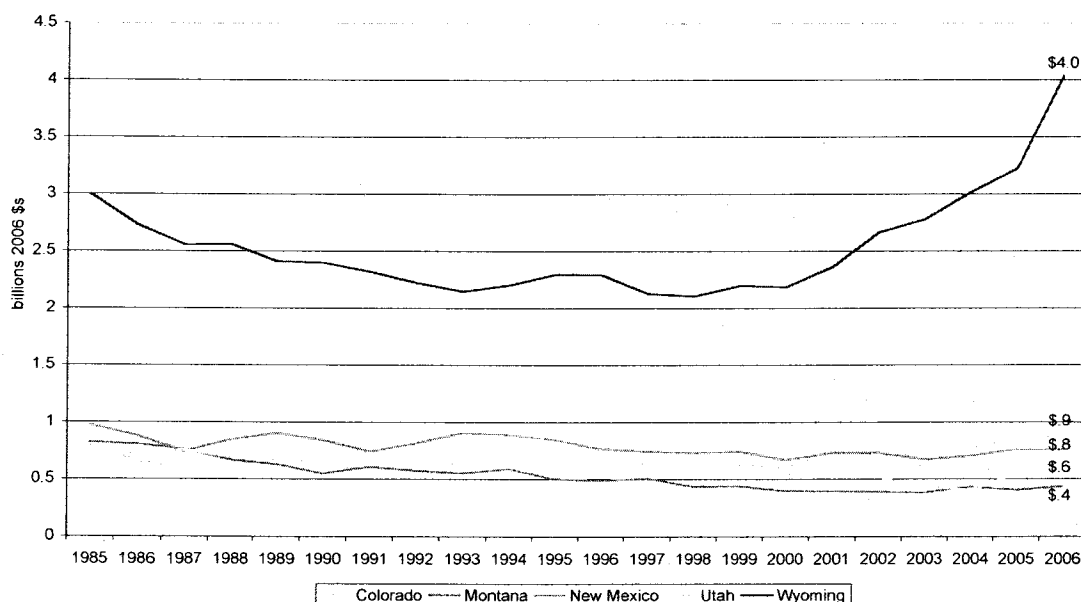
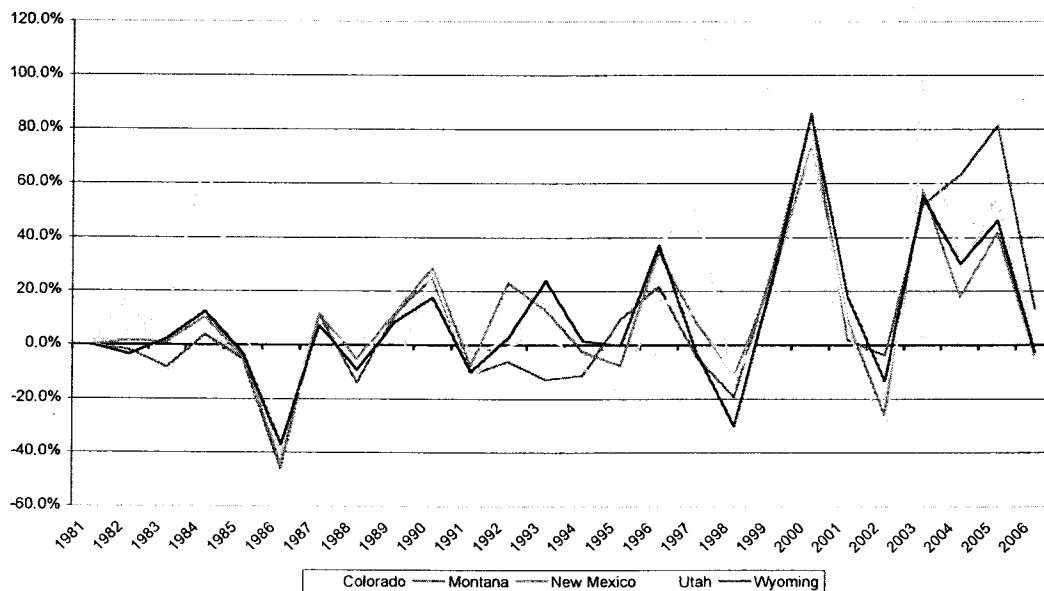


Figure 4 shows that Wyoming is the clear leader in coal production value with over \$4 billion in 2006. The other four states each had less than \$1 billion in the same year, with Montana at less than \$500 million in production value. The production value of coal is much lower than that of oil and natural gas. In 2006, in the five Intermountain West states we profile, the combined production value of oil and natural gas was four to fourteen times higher than the production value of coal.

Figure 5 illustrates volatility in energy production value by graphing percent change in oil and natural gas production value from year to year.⁸ Volatility is important because state and local governments rely on energy revenue to fund basic government services, including education, roads, and public health and safety. The uncertainty of energy revenue from year to year makes it difficult to plan budgets and invest in necessary capital improvements or expansions.

Figure 5: Volatility of Oil and Natural Gas Production Value, Percent Change from Previous Year, 1981–2006.⁹



The average price in the five-state region often rises or falls by 20 percent or more, with larger price swings occurring since 1999. For example, production value in Colorado dropped by more than 20 percent between 2002 and 2003, then rebounded by nearly 75 percent in the next year.

In the current surge in energy development, rapidly increasing natural gas production has largely masked the volatility in price, so states have not felt acutely the instability of mineral production values. However, the inherent instability of energy prices, and the boom-and-bust pattern of energy production in the Intermountain West over time exposes state and local governments to dramatic annual changes in revenue.

Volatility

Volatility in energy production value is a function of two factors: price and production volume. Commodity prices rise and fall dramatically in response to a variety of factors—see our report *U.S. Energy Needs and the Role of Western Public Lands* for a discussion of the factors that influence fossil fuel prices.¹⁰ Production volume responds to changes in demand, price, new technologies, and other factors. Because energy revenue is linked to production value, it can be volatile, too.

Tax policy can exaggerate or lessen revenue volatility. Tax rates and incentives tied to production volume or price will exaggerate volatility (e.g., Utah's severance tax rate is higher when prices are high). States that invest a portion of production tax revenue into permanent funds can build a long-term and a more stable revenue stream from interest income.

Governments depend on energy revenue to provide basic government services. Volatility makes it difficult and risky to plan for necessary infrastructure and services, such as hiring new police officers or building a new school.

Energy Effective Tax Rates: What Proportion of Production Value Does Each State Capture?

The effective tax rate is a ratio of tax revenue to gross production value:

$$\frac{\text{Production Value}}{\text{Tax Revenue}} = \text{Effective Tax Rate}$$

The effective tax rate accounts for differences between states' tax structures, and allows for comparisons of the tax rate paid by industry across states. Higher effective tax rates will capture more value from the same amount of production, providing government with more revenue.

Calculating the effective tax rate is an easy way to compare how each state's tax policy decisions compare because it takes into account all the different taxes, tax rates, and incentives in each state. Table 1 shows production values, energy revenue data, and effective tax rates in Colorado, Montana, New Mexico, Utah, and Wyoming. We added the effective tax rates for production taxes, property taxes, and state and federal royalties to arrive at the total tax rate paid by industry in each state.

Table 1: Production Value, Energy Revenue, and Effective Tax Rate in Colorado, Montana, New Mexico, Utah and Wyoming, 2006.¹¹

	Production Value	Production Taxes	Property Taxes	Royalties	Total Revenue	Effective Tax Rate	State Rank
Wyoming	\$19,205,049,360	\$988,113,065	\$962,592,273	\$1,132,005,554	\$3,082,710,892	15.9%	1
New Mexico	\$14,457,210,310	\$1,059,200,950	\$156,051,915	\$959,905,780	\$2,175,158,645	15.0%	2
Montana	\$3,122,113,050	\$233,495,247	\$11,690,801	\$79,145,790	\$324,331,838	10.4%	3
Utah	\$3,751,395,980	\$77,074,318	\$39,786,879	\$251,799,166	\$368,660,363	9.9%	4
Colorado	\$10,925,100,709	\$211,259,304	\$240,000,000	\$178,656,983	\$629,916,287	6.2%	5

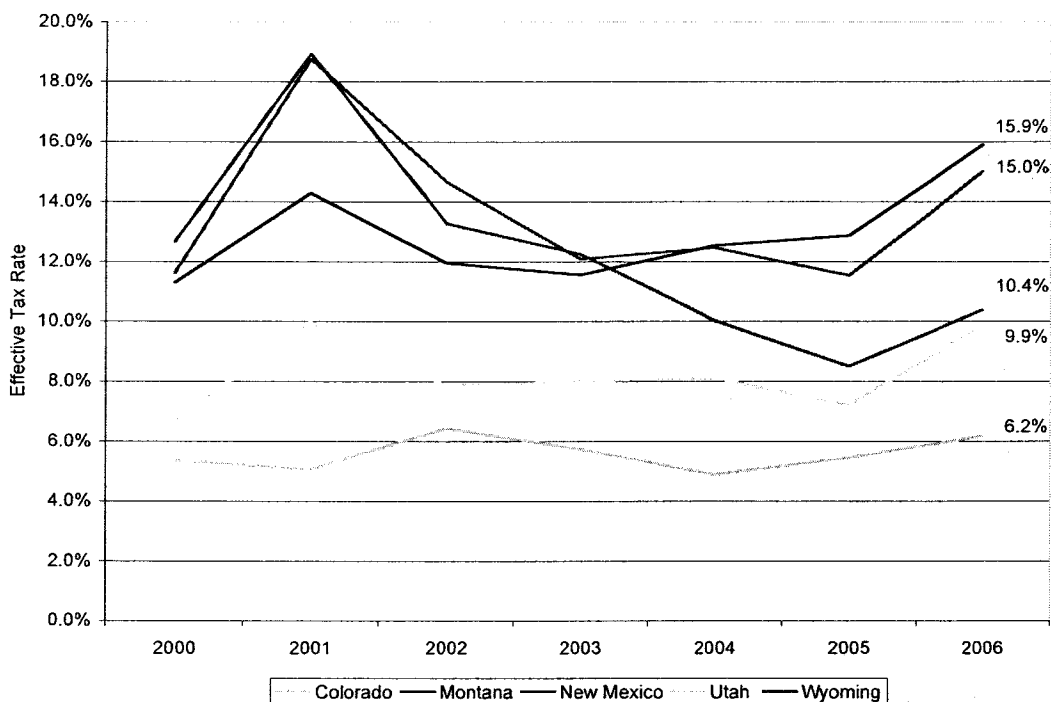
Table 1 shows that effective tax rates vary significantly between the states. Wyoming's effective tax rate of 15.9 percent is one-and-a-half times higher than Colorado's 6.2 percent effective tax rate. New Mexico's 15.0 percent, Utah's 12.1 percent, and Montana's 9.8 percent effective tax rates also show significant variation between the states.

In addition, Figure 6 shows that effective tax rates are highly volatile over time. This can occur when reforms or changes in tax policy are adopted, but more importantly volatility is introduced into tax rates because the tax structure itself is sensitive to commodity price and production volume. For example, some states charge higher tax rates when commodity prices are high, such as Utah's two-tiered severance tax rate that taxes oil and natural gas net income above a certain price threshold at 5 percent and production value below the price threshold at 3 percent.

Tax incentives are also linked to the timing of production. For example, Montana offers a first-year exemption from severance taxes on new oil and natural gas wells. As new production becomes a larger share of all production, the effective tax rate falls. Most states also offer low or no tax rates on "stripper wells" that produce oil and natural gas volumes under a specific threshold.

All of these different tax rates, incentives, and exemptions add up to an effective tax rate that varies as price rises and falls, as new production comes online, and as the productivity of individual wells changes.

Figure 6: Effective Tax Rates on Energy Resources in Colorado, Montana, New Mexico, Utah and Wyoming, 2000–2006.¹²



Summary Findings

Effective tax rates vary dramatically between states, with some states capturing significantly higher amounts of tax revenue from oil, natural gas, and coal production.

Wyoming's effective tax rate of 15.9 percent is one and a half times higher than Colorado's 6.2 percent effective tax rate. New Mexico's 15.0 percent, Utah's 12.1 percent, and Montana's 9.8 percent effective tax rates also show significant variation between the states. Higher effective tax rates will capture more value from the same amount of production, providing government with more revenue. This means Wyoming is in the best fiscal position to mitigate the impacts of energy extraction, and will have more options for investing and spending energy revenue in ways that build long-term wealth. Colorado's low effective tax rate will make it less able to respond to pressing needs, and to leverage wealth from non-renewable resources into broader economic growth.

Public revenue derived from energy production is inherently volatile and states benefit if they address this instability proactively.

Energy taxes and royalties are based on production value, which can be highly volatile. As a result, energy revenue can be highly volatile, too. Providing services from an uncertain revenue stream makes long-term fiscal planning difficult, and can be risky particularly for rural counties and small towns. Local government may use energy revenue to hire new police officers, or to build a new school, only to see revenue fall if energy prices or production drops off. Tax structure has an important dampening or exaggerating effect on revenue volatility, so states have the ability to bring greater predictability to their revenue stream. Colorado and Utah have done relatively poorly at adopting tax policy that manages volatility, while Wyoming and New Mexico have done relatively better.

DOES STATE TAX POLICY AFFECT THE SCALE OF ENERGY EXPLORATION AND PRODUCTION, AND THE AMOUNT OF REVENUE CAPTURED BY GOVERNMENT?

Energy development generates hundreds of million of dollars in tax revenue annually for each of the five energy-producing states we profile—Colorado, Montana, New Mexico, Utah and Wyoming. And in Wyoming, energy revenue accounted for 44% of all state and local government revenue in 2006. Consequently, these states are concerned that tax policy could limit their overall level of production and potentially cost them jobs and income. At the same time, states are looking to ensure that the public receives a fair share of energy revenue. This report stresses that capturing more revenue from energy development is good for the public, but just how far can government go? The evidence is mixed.

In the last year, tax hikes on energy development have been implemented in Alaska, Arkansas and Alberta. Coloradans will vote on a ballot initiative in November to eliminate incentives from the severance tax. If successful, the vote would have the effect of increasing the severance tax rate on oil and natural gas. In these three states and one Canadian province, industry and government have taken different views about the likely outcome of the tax increases, and independent academic studies assessing the resulting impacts on actual production and revenue levels are few.

In the previous section, we explained that effective tax rates on energy production vary dramatically between states. But in the recent surge in energy development, have these divergent rates led to variable levels of investment and production as companies choose to locate in areas with the most favorable tax climate? Wyoming and Montana's divergent choices in the late 1990s offer a case study. In the late 1990s, energy prices were low and new exploration and production were relatively flat in both states. Wyoming faced steep budget deficits, and legislators in both states were looking for ways to jump-start the energy economy.

In the hopes of stimulating production, Montana simplified its tax structure and reduced production tax rates from 15 to 9 percent on oil wells and from 12 to 9 percent on natural gas wells drilled after 2001, and extended the definition of stripper wells (low producing wells) that qualify for lower tax rates. Montana added these reforms on top of existing incentives that nearly exempt new production from production taxes (the rate is 0.5% for the first 12 to 18 months depending on the type of well). As a result, as new production becomes a larger share of all wells in Montana, the effective tax rate on oil and natural gas production declines.

At the same time, Wyoming commissioned two studies to model the likely outcomes of tax incentives and tax increases on the oil and natural gas industries. The studies concluded that tax incentives would not stimulate significant new production or economic activity, but would cost the state millions in lost tax revenue. The studies also found the opposite true: that higher tax rates would produce new revenue with little risk of slowing the energy economy.²⁷ As a result, in 2000 Wyoming eliminated a 2 percent reduction in its severance tax rate granted the previous year.

TAXES AND ENERGY ACTIVITY: ACADEMIC STUDY FINDINGS

In the late 1990s, the Wyoming state legislature commissioned two academic studies to evaluate the likely impact of tax and/or incentive policies on the pace and scale of energy activities. Key findings of the Wyoming research include:

- Production tax incentives have little effect on where energy companies choose to explore and drill. The oil and natural gas industries are guided chiefly by the location of reserves, and are less able to relocate than are industries with mobile capital resources (such as textile mills or auto-makers).
- Production taxes are deductible from federal income tax liability so industry does not feel the full benefit of tax increases, or pay the full increase in tax hikes. When taxes are raised, revenue is shifted from the federal to the state government, and vice-versa.
- Production taxes are "downstream" taxes, meaning they are levied only on successfully producing wells. As a result, production taxes have little effect on exploration. Tax policy can change the timing of extraction. A tax on reserves in the ground tends to accelerate extraction as energy companies attempt to "mine out from under the tax." Taxes on production (i.e., severance taxes) slow production as industry may hold reserves and wait for high prices or other market advantages.
- Other factors such as price, access to markets (e.g., oil and natural gas pipelines), technology, and regulations have more significant effects on industry activities. Considering tax policy alone cannot fully explain industry choices and the resulting geography and pace of energy exploration and production in the Intermountain West.

Sources: S. Gerking, et. al., *Mineral Tax Incentives, Mineral Production and the Wyoming Economy*, 2000 and M. Kunce, et. al., *State Taxation, Exploration, and Production in the U.S. Oil Industry*, 2001. See note 27 (endnotes) for full references.

We calculated in the previous section that the overall tax rate faced by industry is higher, by about 50 percent, in Wyoming than in Montana. This is a direct result of the tax policies pursued by each state in the late 1990s and early 2000s.

What, if any, effect has this had on the energy economy in Wyoming and Montana? Both states have experienced a surge in natural gas drilling and an increase in commodity prices since 2000. Wyoming added over \$10 billion in production value and Montana about \$2 billion between 2000 and 2006. New drilling continues in Wyoming at a faster pace than in Montana, and Wyoming's energy economy is significant. There is little evidence in the overall figures to suggest that firms fled Wyoming's higher tax climate and moved to Montana. If anything, Wyoming's communities where energy development is taking place are overwhelmed by the frantic pace and scale of drilling—see our case study *Impacts of Energy Development in Wyoming, with a Case Study on Sweetwater County* for more information on Wyoming.

By retaining a higher tax rate, Wyoming is in a better position to capture revenue from the current surge in energy production value. Revenue in Wyoming grew by 335 percent from 2000 to 2006, compared to 280 percent in Montana over the same period. At the request of lawmakers in Montana, the Department of Revenue studied the impact of tax incentives introduced in 1999 and calculated they have cost the state \$515 million in lost revenue between 2003 and 2007.²⁸ Debate in Montana is still focused on whether the current surge in production is due to the tax incentives, or would have happened anyway, thanks to higher prices and new technology. While the figures above are not definitive, they lend credence to the latter view.

Although outside the scope of this report, it is instructive to examine briefly the case of Alaska where the state legislature passed reforms in 2007 that will increase the tax rate on oil and natural gas. Alaska's effective tax rate in 2006 was 18.8 percent, already higher than the five states we profile—three times higher than Colorado's effective tax rate of 6.2 percent.²⁹ In Alaska, industry argues tax hikes will diminish their extraction activities and ultimately slow the economy, reducing state tax revenue.³⁰

Like Wyoming, Alaska commissioned an independent review of the evidence. The economic consulting firm hired by the state concluded that the profit margins of oil and natural gas companies are high enough that they should remain highly profitable at higher tax rates. For example, the report found that "the Prudhoe Bay infill drilling program as presented by the Alaska Oil and Gas Association and British Petroleum is so profitable that under even the most extreme net tax structure, oil companies should want to continue their reinvestment program."³¹

What can Colorado voters, who will decide in November whether to support or oppose a ballot initiative that would eliminate two large deductions from the state's oil and natural gas severance tax, learn from these examples? If the ballot measure is approved and the tax breaks are dropped, Colorado's effective tax rate will still be the lowest of the five energy-producing states we profile, and significantly lower than Alaska's. Based on this comparison between Colorado's effective tax rate and those of its neighbors, we expect that Colorado's energy economy will not be affected by the tax increase.

But we also urge caution about drawing too many conclusions about industry activities from tax rates alone. A main message of the Wyoming studies is that tax policy is only one of many factors that influence energy exploration and production, and a small one at that. Furthermore, a focus on tax policy alone can distract from issues important to the public welfare that we turn to next: each state's need to adequately mitigate the impacts of energy development and to ensure that extraction of fossil fuels contributes to long-term economic competitiveness and financial health. The outcomes of energy development, we argue, begin with a fair and effective tax rate.

Summary Findings

States can increase effective tax rates and realize higher revenue from energy development with little risk of affecting the local energy economy.

The oil, natural gas and coal industries are guided chiefly by the location of reserves, and are less able to relocate than are industries with mobile capital resources (such as textile mills or auto-makers). Other factors such as price, access to markets (*e.g.*, oil and natural gas pipelines), and technology have more significant effects on industry activities. We also find no evidence to suggest that the dramatically different effective tax rates in the Intermountain West we have led to more or less investment from state to state. Montana reduced its tax rates and extended incentives to the oil and natural gas industries in the late 1990s. At the same time, Wyoming studied the issue, finding that new incentives were unlikely to stimulate new exploration and drilling, and chose not to alter its tax structure. The results of these choices are clear: Wyoming has captured proportionately higher benefits than Montana from the current surge in energy production value, and there is no evidence that Montana's tax breaks worked—Montana has stimulated less, not more, energy development than Wyoming and left more than half a billion in revenue on the table.

HOW WELL DOES EACH STATE DIRECT REVENUE FROM ENERGY DEVELOPMENT TO MANAGE ITS IMPACTS, AND INVEST AND SPEND REVENUE TO BUILD LONG-TERM WEALTH?

If energy revenue is filling government coffers around the West, what choices are states and local governments making about how to spend these funds? Why should states endeavor to capture high effective tax rates?

Energy development is lucrative for states, but is also an intensive land use that can have significant impacts on communities and the environment. Air and water quality, and fish and wildlife may suffer if drilling is not pursued responsibly. Drilling rigs and heavy traffic can tear apart county roads not designed for heavy industrial use. The influx of new employees can stress local health, police, and social services. Local communities must increase spending significantly to keep pace with new service demands and infrastructure needs. State agencies have no choice but to scale up to continue their existing level of industry oversight. Yet for all this to happen, revenue must be sufficient in time, place, and amount. Otherwise, agencies and communities dealing with the direct impacts of energy development will lack the resources they need, when they need them.

Energy revenue should keep pace with industry impacts, and contribute to long-term well-being where resources are extracted. To do this, energy revenue must exceed what is required to address direct needs and—replacing the wealth that is exported from an area—support new investment in the human and physical capital of a place making it more competitive in the future.

In previous reports in our *Energy and the West* series, we assess the dangers to the public's long-term interests from economic over-specialization. These dangers are particularly acute during surges in energy development, especially for communities where extraction and employees are situated, but also for small state economies such as Wyoming's that are heavily reliant on energy revenue.

In this section, we detail the distribution of energy revenue in each state across three broad categories of spending and investment:

1. **Direct spending on providing services that facilitate energy development.** This includes roads, public safety, permitting and review of energy projects, and regulating and mitigating the impacts of extraction activities on communities, infrastructure and the environment.
2. **Long-term investments.** Investing energy production tax revenue in a dedicated fund creates a long-term income stream to compensate, to some degree, for the permanent depletion of non-renewable resources. In addition, interest earned on permanent investments provides a more stable income stream than inherently volatile tax revenue from energy production.
3. **Support for education, infrastructure, and general government.** A portion of energy revenue should be directed toward agencies, programs, and services that build the state's human and physical capital, adding to future competitiveness and public well-being.

Figure 10 and Table 2 show how energy revenue is distributed across the spending and investment categories defined above for each state in 2006. In the figure and table, “direct energy spending” is defined as all allocations and spending by agencies and governments that directly monitor and regulate the energy industry, build and maintain infrastructure used by the industry (e.g., county roads), and provide services impacted by energy development, such as local police, emergency, and health services. The figure also presents education as a category independent from general government spending. A portion of energy revenue in each state is collected directly by school districts through property taxes, and most states require distributions of production taxes and royalties to public schools.

Figure 10: Percent Distribution of Oil, Natural Gas, and Coal Revenue in Colorado, Montana, New Mexico, Utah and Wyoming, 2006.³²

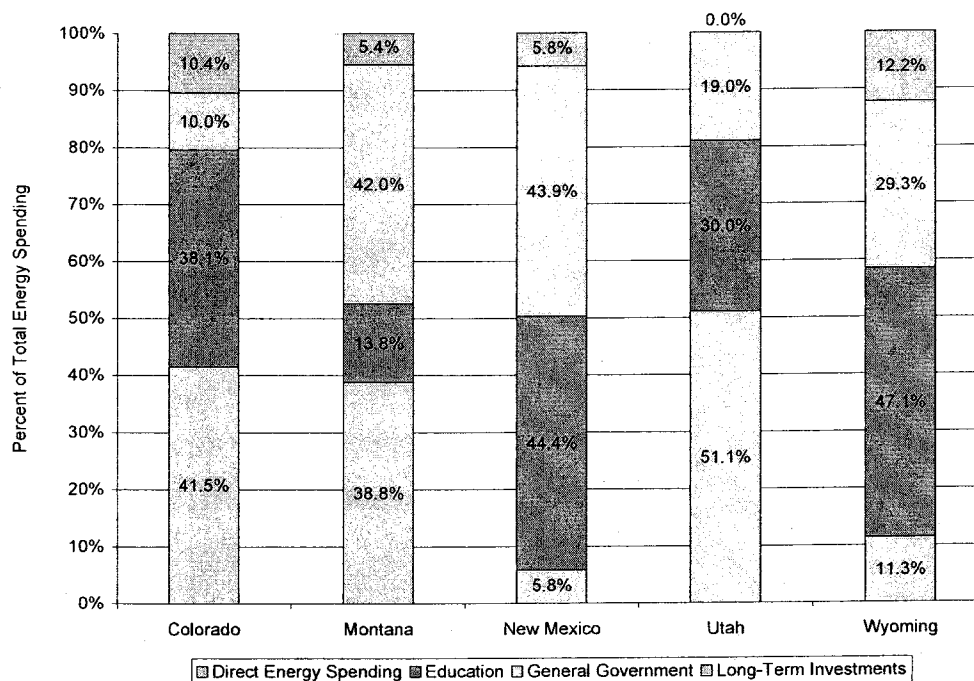


Table 2: Distribution of Oil, Natural Gas, and Coal Revenue in Colorado, Montana, New Mexico, Utah and Wyoming, 2006.³³

	Colorado	Montana	New Mexico	Utah	Wyoming
Direct Energy Spending	\$268,299,353	\$127,673,259	\$124,906,333	\$192,716,693	\$311,230,231
Education	\$246,757,217	\$45,404,465	\$949,696,000	\$113,060,954	\$1,291,756,538
General Government	\$64,707,500	\$138,328,078	\$939,177,577	\$71,513,869	\$804,918,451
Long-Term Investments	\$67,300,000	\$17,910,762	\$123,200,000	\$0	\$335,132,216

Figure 10 shows that Utah allocates the largest share of energy revenue to direct spending that facilitates energy development (orange), followed by Colorado and Montana. These states apportion significantly higher percentages of energy revenue to direct energy spending than do Wyoming and New Mexico. Table 2 shows that Wyoming, despite distributing a small proportion of its energy revenue to direct energy spending, still allocates the largest total dollar amount for this purpose among the five states. This is because Wyoming's energy revenue is significantly higher than its peers, who direct larger shares but from much smaller revenue bases. New Mexico distributes the lowest proportion and the lowest absolute amount to direct spending on facilitation of energy development.

All states spend a large share of revenue on education (brown), much of which includes property taxes levied by local school districts. Montana spends significantly less than its peers at about 14 percent. However, spending on education may be somewhat higher than these figures reflect because a share of revenue distributed to each state's general fund may be used to support public schools, and in the case of Montana a portion of the production tax distributed to local government funds local school districts.

Wyoming directs the largest share of energy revenue to its severance tax permanent fund (gray) thanks in large part to large one-time discretionary payments made from the state's general fund. Colorado is next, investing over 10 percent of all energy revenue into a revolving loan fund that supports water projects in the state (water demand in the state is expected to exceed current supplies by 2030). Montana has capped the permanent fund that would otherwise receive revenue from oil and natural gas development, but continues to invest coal severance tax revenue into a permanent fund. Utah had no permanent fund in 2006, but has subsequently created a severance tax fund that will begin receiving revenue in 2009.

New Mexico and Montana direct the largest proportion of revenue to the state's general fund (green), followed by Wyoming. Colorado and Utah spend the smallest proportion on general government, directing about 10 percent and 20 percent, respectively, to the general fund. General government expenditures by the state benefit all of a state's citizens, but they may or may not address the impacts of energy development, or be used to promote economic diversification or broader competitiveness. (General government is defined as revenue directed to the state's general fund. These dollars are used for public benefit, but may or may not be dedicated to one of the three main categories used in this study. Close examination of the details of general fund spending is beyond the scope of this report.)

Figure 11: Principal Balance, Annual Investments, and Annual Income from Production Tax Permanent Investment Funds, FY 2006.

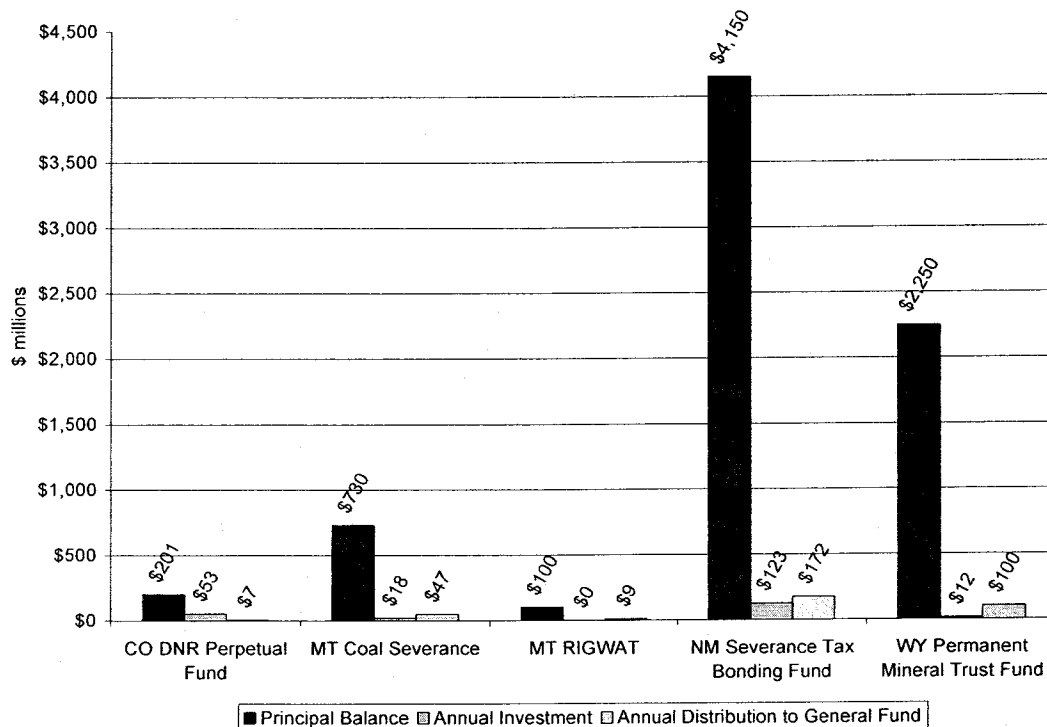


Figure 11 shows that Colorado's Department of Natural Resources (DNR) Severance Tax Perpetual Fund stood at \$201 million in 2006. The funds are managed by the Colorado Water Conservation Board and provide a revolving low-interest loan fund for water projects, as well as a long-term funding stream for capital construction, maintenance, and study of water projects. Twenty-five percent of annual severance tax collections are distributed to the DNR Perpetual Fund, amounting to \$53 million in 2006. In 2006, investment and loan income totaled \$6.7 million.

Montana's Resource Indemnity and Groundwater Assessment Tax (RIGWAT) permanent fund reached its cap of \$100 million in 2002. As a result, Montana does not invest any current oil and natural gas production tax revenue in a permanent fund, instead depositing about 90 percent of the state share of production taxes into the general fund. By comparison, 50 percent of the state's coal severance tax is invested into a suite of perpetual and revolving loan funds with a combined principal balance of about \$730 million in 2006.³⁴

New Mexico's Severance Tax Bonding Fund had a market value of \$4.15 billion in 2006.³⁵ Over time, oil and natural gas production has contributed the lion's share of revenue into the fund, with coal and other minerals making up the rest. New Mexico's severance tax is first directed to pay down severance tax bonds issued by the legislature to fund state infrastructure projects. The remainder is directed to the fund. In the last ten years, the distribution to the fund has varied between 1 percent and 85 percent of annual severance tax revenue. In 2006, 25 percent of severance taxes were placed in the fund, totaling \$123 million.

Utah is the only state with no current severance tax permanent fund, although one was recently created and will begin receiving all annual severance tax revenue over \$41 million after 2008.

The Permanent Wyoming Mineral Trust Fund (PWMTF) had a market value of \$2.97 billion at the end of 2006.³⁶ 2.5 percent of severance tax revenue is distributed to the PWMTF, along with periodic one-time payments at the discretion of the legislature. In 2006, total distributions to PWMTF totaled 46 percent of all severance taxes (essentially a redistribution from the general fund). Investment earnings from the PWMTF flow to the state General Fund (\$123.95 million in FY 2006, representing 12.7 percent of total FY 2006 state General Fund revenue).

Each state invests a portion of state royalties from trust lands into a permanent fund that supports public schools. Because these funds are similar from state to state, we do not show them here, but focus instead on how production taxes are invested. Production tax revenue is invested at the discretion of the legislature, unlike school trust revenue, and is a better indication of each state's approach to investment.

Different Distributions between States: A Closer Look

In this section, we discuss some of the main differences between state spending decisions, and highlight what we see as comparative strengths and weaknesses.

Colorado

Direct Energy Spending: Colorado statute directs that local governments, including cities and counties directly impacted by energy development, receive more than half of all energy revenue—the highest proportion of the five states we profile. Half of severance taxes and about 40 percent of federal royalties are distributed to cities and counties through the Department of Local Affairs (DOLA) direct and grant distributions. Property taxes are retained entirely by local governments and school districts. In total, 51 percent of energy revenue is allocated to direct spending that facilitates energy development and mitigates its impacts.

Despite the high proportion of mandated distributions, we estimate only 41 percent is returned to cities and counties where development is taking place, meaning 10 percent of funds intended for energy-focused local governments and state agencies that provide direct services to the energy industry are diverted instead to general government needs. The state auditor detailed what he concluded to be the misdirection of Department of Local Affairs (DOLA) grants in a 2007 report,³⁷ and DOLA documents that \$29 million in severance taxes in 2006 funded "other state programs"

instead of accruing to the Department of Natural Resources, the agency responsible for monitoring and regulating energy development in the state.³⁸ A second state auditor's report explains that the lack of funding and training for DNR staff has led to ineffective oversight of industry in Colorado.³⁹

In addition, a review of DOLA's grants that did go to energy-focused communities were often not in the form, amount, or time required to handle pressing needs. For example, grants are too small to cover the costs of large road projects, and the annual grant cycle makes it nearly impossible to fund ongoing service needs from these funds.⁴⁰

General Government: Colorado is the only state that does not require any funds be deposited into its general fund. However, the state has consistently used severance tax funds intended for the Department of Natural Resources on general government activities, to the tune of \$29 million in 2006. In addition, a large share of DOLA grants went to communities with little or no energy development, using these funds to support needs unrelated to the energy economy. In total, 10 percent of all energy revenue is diverted to other state and local government needs not associated with energy development.

Our report does not assess the net outcome of these diversions from direct spending to the general government, but it is worth asking if Colorado is missing an opportunity to provide communities and agencies dealing directly with the energy industry with adequate funding to cope better and benefit more fully from oil, natural gas, and coal extraction.⁴¹ We began this report by highlighting a Colorado legislative committee's tour of the West Slope, leading the participants to agree that the current level of funding to Colorado's energy-focused communities is insufficient to deal with the pace and scale of energy development they face. We turn to this issue more fully in a later report in our *Energy and the West* series that profiles Garfield and Mesa Counties in Colorado.

Long-term Investments: Considerable confusion exists in Colorado over the state's investments. The *Rocky Mountain News* reported that the state has no permanent fund.⁴² In reality, Colorado is required to invest the largest proportion of its severance tax revenue annually into the DNR Severance Tax Perpetual Fund (although New Mexico and Wyoming have made larger annual contributions to their permanent funds over time).⁴³ The single-purpose use of the DNR fund for water projects sets Colorado apart from its peers that use investment income to fund general government programs. Reforms on the ballot in November 2008 propose to invest 15 percent of new severance tax dollars into a second perpetual fund that will eventually support a broader suite of state and local services, including public education.⁴⁴

Montana

Direct Energy Spending: Montana's production tax revenue is split between the state and local governments roughly 50/50. This is an improvement over local property taxes that the production tax replaced because the production tax is levied against the current year's production value, reducing the lag between production activities and revenue to local government. The state's first-year exemption on new drilling re-introduces a lag, but to a lesser extent because only the new portion

of production in the county is exempt.

Long-term Investments: Montana is the only state not investing current revenue from oil and natural gas into a permanent fund (Utah created a severance tax fund in 2008). With recent price increases, oil and natural gas production now generates nearly six times the revenue of the coal severance tax on an annual basis. By using all oil and natural gas revenue on a “pay as you go” basis, Montana is missing an opportunity to build a long-term income stream from one-time oil and natural gas wealth extracted from the state.

New Mexico

Direct Energy Spending: New Mexico distributes very few of its production taxes directly to city and county governments, leaving local government largely dependent on a relatively small property tax base from oil, natural gas, and coal. As a result, local governments receive a smaller share of mineral production value when compared to the state, and to local governments in other states. The oil and natural gas conservation fee funds the state Division of Oil, Gas and Mining and the oil and gas reclamation fund.⁴⁵

General Government: State severance taxes are first used to pay debt service on bonds issued for the purpose of building New Mexico’s infrastructure. Any remaining funds are directed to the state’s permanent fund. Revenue from the emergency school tax is deposited in the general fund, and pays for the state’s school equalization program. New Mexico’s school equalization program places an emphasis on state funding for schools to reduce the differences between wealthy and poor taxing districts.⁴⁶ As a result, local schools in New Mexico are less dependent on property taxes than schools in other states.

Long-term Investments: New Mexico’s permanent severance tax fund returns 4.7 percent of the 5-year average market value to the state general fund annually (\$172 million in 2006). New Mexico’s distribution formula returns a more stable revenue stream to the state than other states who distribute annual investment earnings. If the corpus of the fund grows slower than 5 percent, the state is effectively spending down the principal of the Trust. When investments grow faster than 5 percent, the state is effectively reinvesting interest income and growing the fund.

Utah

Direct Energy Spending: Utah distributes the majority of energy revenue to local governments. Forty percent of federal royalties fund local highways and are distributed to counties proportionate to the amount of federal royalties generated in each county. The majority of the balance is distributed through the Permanent Community Impact Fund that makes loans and grants to state agencies and local governments impacted by energy development.

General Government: Currently, all state severance tax collections are deposited in the state’s general fund. However, reforms adopted this year will see annual severance tax revenue above \$41 million directed to a permanent fund instead of the general fund. Additional reforms that had proposed to spend some revenue on dedicated economic development programs intended to diversify the state’s economy failed, meaning severances taxes up to \$41 million will still go to the general fund.

Long-term Investments: Utah is the only state with no current severance tax permanent fund, although one was recently created and will begin receiving annual severance tax revenue over \$41 million after 2008.

Wyoming

Direct Energy Spending: Wyoming returns a low proportion of state revenue directly to local governments.⁴⁷ Only about 3 percent of severance taxes and 2 percent of Federal royalties go to cities and towns. This leaves local government almost wholly dependent on local property tax collections.

General Government: Wyoming's state government has done well during the current surge in production values in the state. Natural gas drilling and high commodity prices reversed a \$200 million budget deficit in 1999, and the state currently sits on a billion dollar surplus. Local governments where drilling is taking place have not seen the same kind of windfall.

Schools have enjoyed increasing revenue as well. Nearly half of all energy revenue is directed to public schools, and the state offers Wyoming high school graduates generous scholarships to attend university, paid for with energy revenue to the state. Twenty-seven percent of federal royalties went to public schools through the School Foundation and Capital Construction Funds in 2006. The remainder (about 70 percent) of production tax and federal royalties went directly to the general fund, or into the state's permanent fund that returns interest revenue to the general fund.

Summary Findings

Some states direct higher sums to address immediate needs directly related to energy extraction, while others do a better job investing in permanent funds to provide income to meet future needs.

Colorado and Utah distribute the highest proportions of revenue from energy production to communities and agencies managing the direct impacts of extraction activities. Wyoming and New Mexico retain proportionately more at the state level, depositing revenue in the state general fund. On the one hand, these two states steer smaller proportions of energy production tax revenue to communities where the impacts from energy development are often acute and can erode quality of life for citizens if they are not adequately mitigated. On the other hand, Wyoming and New Mexico have invested the largest amount of energy revenue into permanent funds, which now generate significant income that helps to pay for education and infrastructure statewide. Montana rests squarely in the middle, sharing oil and natural gas production taxes evenly between the state and local governments where energy production is taking place.

CONCLUSIONS

The extraction of oil, natural gas, and coal is a one-time opportunity to create wealth for the long-term benefit of the West's citizens. State and local government leaders should ensure that industry access to these resources is balanced with policies that ensure public benefit.

Energy development is intensive, and can have significant impacts on communities and the environment. Communities focused on energy development should also be wary of economic overspecialization and volatility. Tax policy can generate revenue to mitigate the immediate impacts of energy production, and invest in infrastructure and services. It can also support permanent funds that can be used to invest in long-term competitiveness and well-being, and smooth the volatility of the energy industry and revenue.

States in the Intermountain West make remarkably different choices about how to tax and distribute the proceeds of energy development, and these choices go a long way toward determining the net benefits of fossil fuel extraction.

Each of the five Intermountain West states we profile captures hundreds of millions of dollars annually from oil, natural gas, and coal taxes and royalties. Ultimately, each state realizes a very different percentage of the value of energy extracted within their borders based on state tax structures. Thus, each is positioned differently to benefit from production. Wyoming and New Mexico leverage the highest rates, nearly one and a half times the rate in Colorado. Colorado is pursuing reforms, but even if these are approved, they will leave the state with the lowest effective tax rate of the five states we profile. Our research suggests that states can be more aggressive in increasing tax rates with little risk of dampening the energy economy and associated revenue.

Spending decisions differ as dramatically as tax structure. States that spend the most on directly addressing the impacts of the energy industries include Utah and Colorado, although Wyoming spends the most in absolute terms. New Mexico and Wyoming direct the largest sums to the state's general fund. Addressing the direct impacts of the energy industries is essential to maintaining the existing quality of life and healthy business climate for small and large companies outside the energy industry. Ideally, revenue should be sufficient to allow states to invest a portion to build a long-term and stable revenue stream, and to invest in economic development strategies that benefit the rest of the economy.

In this report, we provide a framework that will help decision-makers identify questions and where to look for answers. We explore the net benefits of energy development in more detail in four state and county-level reports in our *Energy and the West* series available at: www.headwaterseconomics.org/energy.

ENDNOTES

- ¹ Colorado State Legislature 2007 Interim Committee on Severance Tax and Federal Mineral Lease Revenue Allocation. *Working Group Recommendations for Interim Committee on Severance Tax and Federal Mineral Lease Revenue*, October 10, 2007. http://www.state.co.us/gov_dir/leg_dir/lcsstaff/2007/07interim.htm
- ² These five states account for the majority of all energy development in the Intermountain West. For more, see: Headwaters Economics, *U.S. Energy Needs and the Role of Western Public Lands*, 2008. http://www.headwaterseconomics.org/energy/HeadwatersEconomics_EnergyNeedsandWest.pdf
- ³ The oil and gas industry also generates an array of secondary and indirect revenue, including corporate and individual income taxes, sales taxes, and indirect business taxes associated with increased economic activity. We focus here only on revenue directly associated with extraction activities.
- ⁴ **For total state and local government revenues, see:** U.S. Census Bureau, Census of Governments, "State and Local Government Finances by Level of Government and by State, 2006," <http://www.census.gov/govs/www/estimate06.html>. **For federal mineral royalty distributions to each state, see:** U.S. Department of the Interior, "Mineral Management Service Disbursement Tables for 2006," <http://www.mrm.mms.gov/MRMWebStats/Home.aspx>. **For revenue information for Colorado, see:** Colorado Department of Revenue, *Annual Report, 2007*, http://www.revenue.state.co.us/Stats_dir/anlrpt07.pdf. Colorado Department of Local Affairs, Division of Property Taxation, *Mineral Revenues to the Public Sector in Colorado*, http://dola.colorado.gov/dlg/faf/iaf/slide_show.html (accessed September 19, 2008). Colorado State Land Board, 2006. **For revenue information for Montana, see:** Montana Office of Budget Programming and Planning, *2007 Executive Budget*, http://mt.gov/budget/budgets/2007_budget/2007_budget.asp. Montana Department of Revenue, *2005-2006 Biennial Report*, <http://mt.gov/revenue/publicationsreports/biennialreports/2005-2006biennialreport.pdf>. Montana Trust Land Management Division, *Fiscal Year 2006 Annual Report*, http://dnrc.mt.gov/About_Us/publications/2006/dnrc06ar.pdf. **For revenue information for New Mexico, see:** New Mexico Oil and Gas Conservation Division, Energy, Minerals and Natural Resources Department, *Fiscal Year 2007 Annual Report*. State of New Mexico Department of Taxation and Revenue, *2006 Property Tax Facts*, <http://www.tax.state.nm.us/pubs/TaxreseStat/2006propertytaxfacts.pdf>. Mining and Minerals Division, New Mexico Energy, Minerals and Natural Resources Department, *New Mexico's Natural Resources Reports*, <http://www.emnrd.state.nm.us/MMD/Publications/NaturalResourcesReport.htm>. **For revenue information for Utah, see:** Utah State Tax Commission *Annual Report, 2006*, <http://tax.utah.gov/research/reports.html>. State of Utah Property Tax Division, *Annual Statistical Report, 2006*, <http://propertytax.utah.gov/finalannualstats/finalannuals.html>. Utah Trust Lands, *Annual Report, 2006*, http://trustlands.utah.gov/news/annual_reports.html. **For revenue information for Wyoming, see:** Wyoming Department of Revenue, *2006 Annual Report*, <http://revenue.state.wy.us/PortalVBVS/DesktopDefault.aspx?tabindex=3&tabid=10>. Wyoming State Government *Revenue Forecast*, January 2008, State of Wyoming Consensus Revenue Estimating Group (CREG), http://leadiv.state.wy.us/creg/GreenCREG_Jan08.pdf. State of Wyoming *2006 Annual Report*, State Trust Land and Investments Office, http://www.wsl.state.wy.us/slpub/reports/2006/37State_Lands_and_Investments_Office.pdf. State of Wyoming Treasurer's Office *2006 Annual Report*, <http://treasurer.state.wy.us/publications.asp>.
- ⁵ Revenue information for Colorado, Montana, New Mexico, Utah, Wyoming, above n 4.
- ⁶ U.S. Department of Energy (D.O.E.), Energy Information Administration (E.I.A.) *Natural gas wellhead prices, 1985-2006*. http://tonto.eia.doe.gov/dnav/ng/ng_pri_sum_a_EPG0_FWA_DMcf_a.htm. U.S. D.O.E., E.I.A., *Oil prices, 1985-2006*. http://tonto.eia.doe.gov/dnav/pet/pet_pri_dfp1_k_m.htm. U.S. D.O.E., E.I.A., *Gas production, 1985-2006*. <http://tonto.eia.doe.gov/dnav/ng/>

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- ⁷ U.S. D.O.E., E.I.A., *Annual Coal Reports, 1994-2006, Monthly Coal Files, 1985-1993*. http://www.eia.doe.gov/cneaf/coal/page/acr/acr_sum.html and <http://www.eia.doe.gov/cneaf/coal/weekly/weekly.html/archmonth.html>. U.S. D.O.E., E.I.A., *Coal prices, 1985 to 2000, Coal Industry Annuals and 2001-2005 Annual Coal Reports*. <http://www.eia.doe.gov/cneaf/coal/page/acr/backissues.html>.
- ⁸ Another common method to illustrate volatility is by measuring the standard deviation of price distribution within a year. See Jose Luis Alberro, Ph.D., "Comparison of Oil and Gas Tax Burdens in Nine Producing States" (LECG: 2008), report prepared for the Colorado Petroleum Association, <http://www.coloradopetroleumassociation.org/Oilandgastaxes.pdf> (accessed August 21, 2008).
- ⁹ Production values, above n 6.
- ¹⁰ Headwaters Economics, *Energy and the West*, 2008.
- ¹¹ Production values, above n 6, above n 7, and Federal mineral royalty distributions, and states revenue, above n 4.
- ¹² Ibid.
- ¹³ Production values, above n 6, and Federal mineral royalty distributions, Colorado revenues, and Wyoming revenues, above n 4.
- ¹⁴ "Why is the state severance tax revenue so variable?" Colorado Department of Local Affairs (DOLA), Division of Local Government: Energy and Mineral Impact Assistance (slide show, *Background Papers on Public Revenue from Mineral Production in Colorado*, March 14, 2008) http://dola.colorado.gov/dlg/fa/ciaf/docs/why_is_sev_rev_volatile.pdf. Colorado DOLA, "Forecasting Colorado State Severance Tax," 2007. http://dola.colorado.gov/dlg/fa/ciaf/docs/why_is_sev_rev_volatile.pdf.
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**MINERAL TAX INCENTIVES, MINERAL
PRODUCTION AND THE WYOMING ECONOMY**

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EXECUTIVE SUMMARY

The minerals industry accounts for a substantial share of tax revenues to the State and to local governments in Wyoming. In FY98, taxes directly paid by the minerals industry totaled \$542 million and represented about 42% of State and local tax collections (Tax Reform 2000 Committee 1999). These revenues were obtained primarily from severance and property taxes levied against the value of production of oil, natural gas, coal, trona, uranium, and other minerals. Periodically, since 1983, the Wyoming Legislature has granted tax incentives (see Appendix A) to the minerals industries for the purpose of stimulating production, tax collections, and job creation across the State. Wyoming is not unusual in this regard: Other mineral producing states also grant a myriad of tax exemptions and incentives (usually discounts against existing tax liabilities) for special situations faced by operators. In 1999, the Wyoming Legislature appropriated funds for an econometric study of the effects of mineral tax incentives granted under current law (1999 Wyoming Session Laws, Chapter 168, Section 3). This report summarizes results of this study for the oil, gas, and coal industries.

By statute, and by agreement with the Legislative Subcommittee overseeing this project, this report must address two questions. First, to what extent do mineral taxes, tax incentives and environmental regulations increase or decrease tax collections to Wyoming entities as compared with amounts that would be collected in their absence? Second, to what extent do taxes, tax incentives and environmental regulations alter employment and other economic activity in Wyoming as compared with what would occur in their absence? These questions are interpreted broadly; for example, the term "Wyoming entities" refers to state government, political subdivisions (such as cities, towns, counties,

and school districts), and other special districts. Employment and other economic activity in Wyoming refers to all sectors of the State's economy, not just those closely related to mineral extraction. Finally, and perhaps most importantly, the study not only evaluates existing incentives and regulations, it also develops a framework that can be used to support future decision-making on State tax policy.

Chapter 2 presents background by looking at the economic effects of all major types of taxes and royalties levied on the oil and gas industry by federal, state, and local governments in the United States. This background is important for three reasons. First, it provides the perspective needed to evaluate the incidence or ultimate burden of an increase in taxes or elimination of tax incentives. In the case of Wyoming oil and gas, taxes are shifted backward entirely to operators and resource owners. Wyoming oil and gas production represents only a tiny fraction of the world market for petroleum products and, therefore, producers in Wyoming are price-takers, not price-makers. Second, the review introduces the concept of an effective tax rate. Effective tax rates are particularly useful in accounting for effects of tax incentives, such as those that have been granted to oil and gas producers in Wyoming. For example, an effective severance tax rate on Wyoming oil production can be computed by dividing total oil severance tax payments by the value of oil production. Because this calculation focuses on actual tax payments, it fully accounts for all applicable tax incentives. All of the analyses presented in this report are based on effective rates of taxation so that tax incentives can be appropriately modeled.

Third, the review underscores the fact that different types of taxes have different economic effects. Important taxes levied on the oil and gas industry can be grouped into

three broad categories; production (severance and *ad valorem*), property and income. Production taxes are levied on the value (or volume) of the oil and gas as it is extracted from the ground or at the point of first sale. This type of tax is seen by producers as an increase in production costs and tends to lower output by causing marginal wells to be shut-in at earlier dates than they would be in the absence of the tax. Conversely, a change in a property tax rate levied on reserves in the ground, or equipment, tends to increase the rate of current production as producers have an incentive to "mine out from under the tax." Finally, a state or federal corporation income tax levied on the accounting profits of the oil and gas firm (the difference between total revenue and total costs) would be predicted to have no effect on current production. The objective of the firm is to maximize profits, and therefore, a tax on net revenue should not alter the rate of output.

Reliance on these three types of taxes differs substantially between the eight states responsible for about 73% of U.S. oil and 83% of U.S. gas production (Alaska, California, Kansas, Louisiana, New Mexico, Oklahoma, Texas, and Wyoming). All states except California levy production taxes against the gross value of output. Most states do not levy property taxes on the value of reserves in the ground (Texas and California do). Most states treat royalty payments (computed as a percentage of gross value of production) for production on public land as deductible items in computing severance tax liabilities (Louisiana and Kansas do not). Most states levy a corporate income tax on income that applies to oil and gas operators (Wyoming and Texas do not). Louisiana permits federal corporate income tax payments to be deducted against its state corporate income tax liabilities, but this feature is not currently available in the other five states that levy state corporate income taxes. All states define tax bases differently and levy taxes at different

rates. Within states, counties apply their own mill levies to compute property taxes on above-ground and down-hole equipment at different rates. Tables 2.1 and 2.2 summarize differences in tax rates in selected years for the eight major oil and gas producing states. These comparisons use effective tax rates in order to account for differences in tax incentives between states. This report primarily analyzes changes in production taxes and production tax incentives. Wyoming relies heavily on production taxes at the state and local level to support public services. Also, tax incentives for oil and gas producers (see Appendix A) are discounts from production (severance) tax liabilities.

Chapter 3 develops an empirical framework that can be used to show how changes in taxes, tax incentives, and environmental regulations alter the timing of exploration and production by firms in the oil and gas industry in Wyoming and in other states. This framework embeds econometric estimates into Pindyck's (1978) widely cited dynamic model of exhaustible resource supply. The model is estimated using published data on drilling, production, reserves, and costs from industry sources including the American Petroleum Institute and from government sources including the U.S. Department of Energy. Federal, state, and local effective tax rates also are built into the model. Federal tax data also were obtained from published sources; however, state and local oil and gas tax data were mostly obtained from state government sources.

The model has seven advantages. First, it can be applied to any of 21 U.S. states (including Wyoming) that produce significant quantities of oil and gas. Second, the model can be used to assess the impact on drilling and production of a change in any tax or tax incentive that currently exists in any of these states. Third, the model accounts for interactions between taxes and tax incentives levied or offered by federal, state, or local

governments. Fourth, the model can be used to compute the effects on drilling and production of any environmental regulation that affects oil and gas operations and interactions between regulations, taxes, and tax incentives are fully accounted for. Fifth, the model is based on a widely accepted theoretical framework that links exploration to development to extraction. Sixth, the model accounts for differences in the quality of oil and gas produced between states as well as differences in transportation costs by adjusting the wellhead price to reflect these aspects. Seventh, the model runs in Microsoft Excel and is therefore quite simple to use. For these reasons, the model is arguably superior to and more comprehensive than previous efforts to develop econometric and/or simulation models of taxation and regulation of natural resource exploration and production.

The model also has three limitations that ought to be recognized. First, data used to implement the model certainly are not perfect. Data on oil and gas extraction costs are particularly weak. However, the best quality public data available have been used to develop the model. Second, the model does not envision interactions between states that arise from changes in tax or regulatory policy. In other words, the model shows that a tax incentive offered in Wyoming may increase oil and gas drilling and production there, but does not indicate the source of these additional investment dollars. Correspondingly, the model shows that a tax incentive offered in, say, Oklahoma might affect exploration and production there, but does not allow for the fact that a portion of the effect might spill over into Wyoming. Simplifications must be made in the development of any model and these particular simplifications are made for two reasons. (1) Accounting for interstate effects would result in only minor changes in results presented. (2) A fully interactive analysis of oil and gas activity in different states would be quite complex and more

difficult to develop. Third, the model does not account for deviations from a strict dollars and cents, profit-maximizing point of view of investment decisions. Business decisions in certain situations may have broader motivations than pure profit maximization; yet, profit maximization is probably the best single rule that can be used to predict how these decisions will be made. None of these limitations, however, are serious enough to invalidate the general conclusions presented in the report.

Chapter 4 uses the model to simulate the effects of changes in tax policy in Wyoming and in five additional oil and gas producing states. Effects of tax changes in Wyoming are heavily emphasized in the discussion, and results are reported for other states mainly for purposes of comparison. Four of these tax change scenarios deal with actual Wyoming production tax incentives and results are shown in Table ES.1. All of these scenarios assume that oil and gas prices will be maintained at current levels in real terms in perpetuity. Chapter 4 considers other possible future price trajectories, but these alterations have little or no effect on the results presented below.

One scenario considered envisions a once-and-for-all 2 percentage-point reduction in the state severance tax on Wyoming oil production. According to the model, this tax change results in only a small stimulus to production and drilling. Output of oil and gas would rise by a total of 50 million barrels of oil equivalent (BOE) (0.7%) over the next 60 years as compared with a base case in which taxes do not change. Regarding drilling, the effect of the tax change is somewhat greater. Over the 60-year life of the program, the tax cut contemplated would result in additional drilling of 1119 wells. This figure represents a 2.3% increase in total wells drilled as compared to the base case in which taxes do not change. This scenario would reduce the present value (at a 4% discount rate) of oil

severance tax collections by 17% over the 60-year time considered, but would result in increased sales tax collections by about 2.3% because of the increase in drilling. A variant of this scenario also is considered in Chapter 4 that envisions a 2 percentage-point severance tax reduction on oil for one year and an elimination of this tax incentive after that time. This tax incentive results in a tiny increase in drilling activity over 60 years (13 wells) and virtually no change in production activity.

In a second scenario, the severance tax is reduced in perpetuity on all new oil and natural gas production by 4 percentage points. This tax incentive results in an increase in drilling by 5.6% and a 1.7% increase in natural gas output over a 60-year time horizon. However, this incentive results in a loss in present value (again using a 4% discount factor) of severance tax revenue of about 43%. This large reduction in severance tax revenue occurs because as time goes by, new production accounts for an increasing percentage of total production. Again, severance tax losses are partially offset by increased sales tax collections (due to increased drilling), but the overall story is one of a substantial net loss in tax revenue. Table ES.1 also shows results of additional simulations for a perpetual 2 percentage-point reduction in the severance tax on tertiary production and a perpetual 4 percentage-point severance tax reduction on well workovers and recompletions. As shown in the table, production, drilling, and tax consequences of these two incentives are smaller than for the previous incentives considered.

A key question regarding these simulation results is: Why is the response of oil and gas output so small when production taxes are changed or tax incentives are applied? There are four reasons why this is so. First, a reduction in production taxes (or an increase in tax incentives) offers no *direct* stimulus for exploration. This point is discussed more